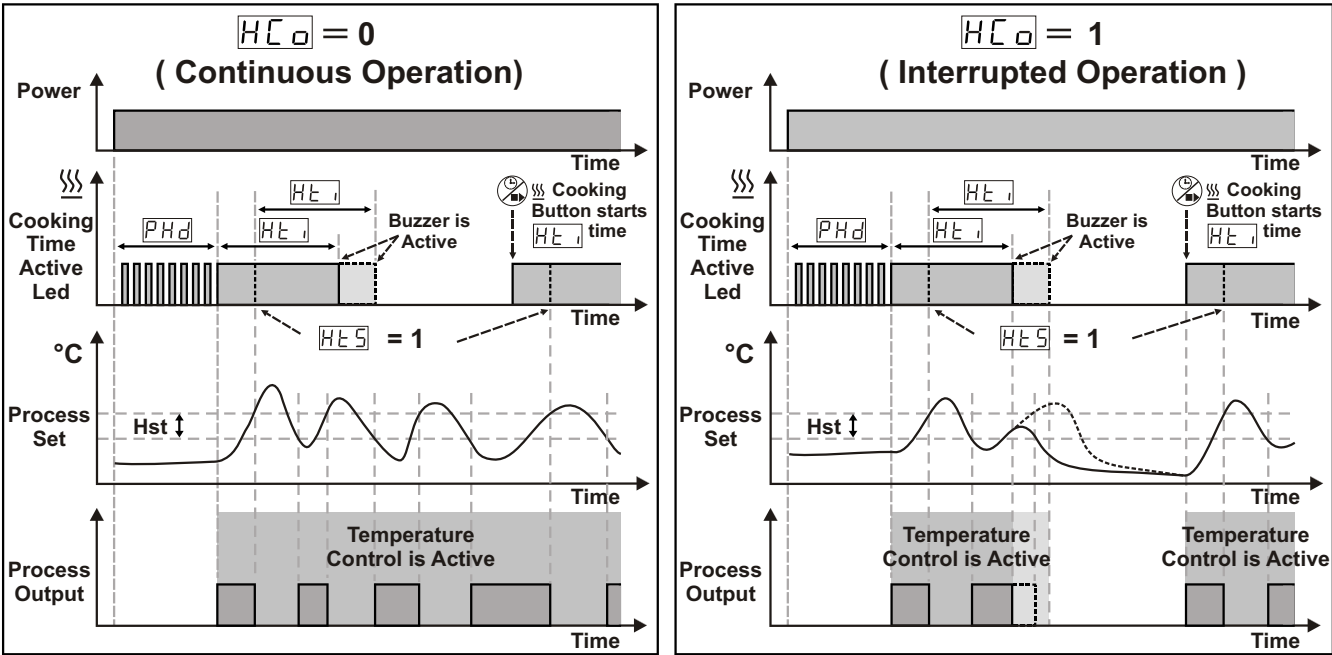
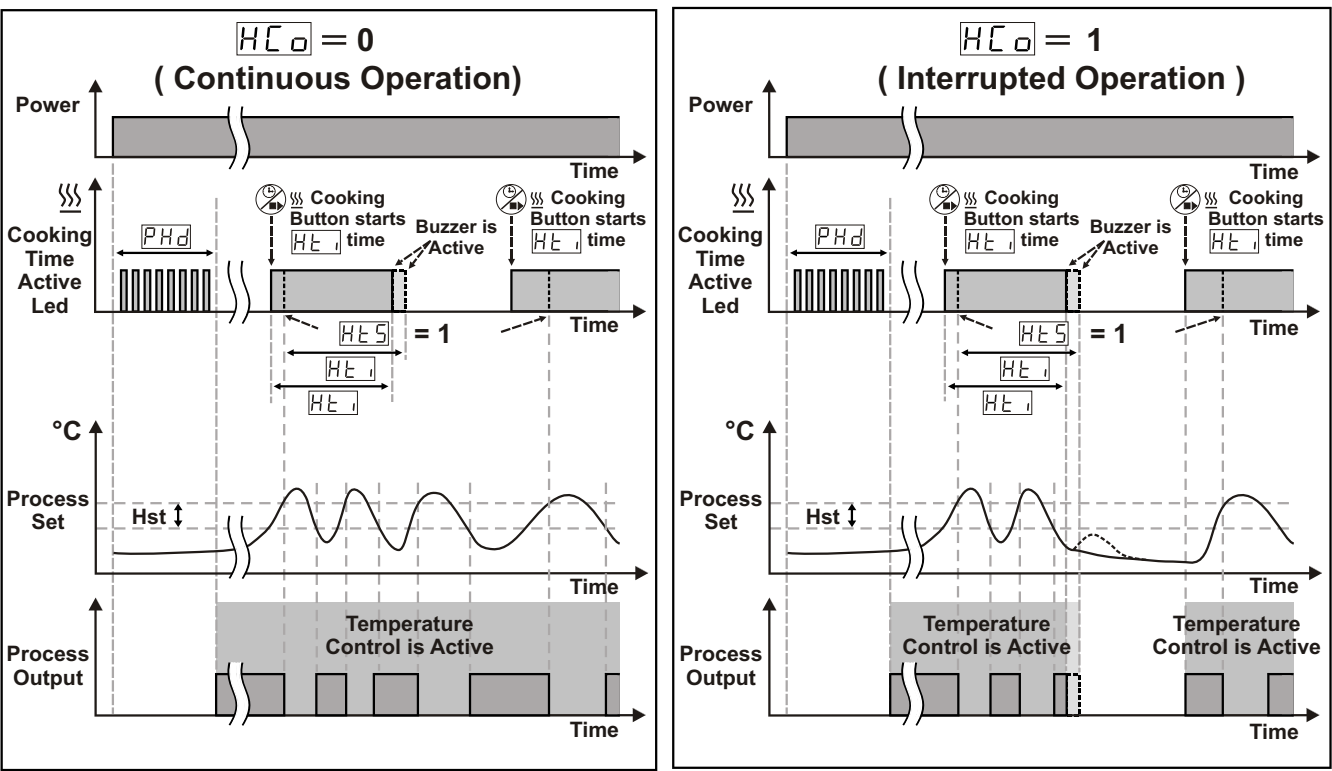


#### 4.7 Operation Graphics of ESM-3711-H Heating Controller

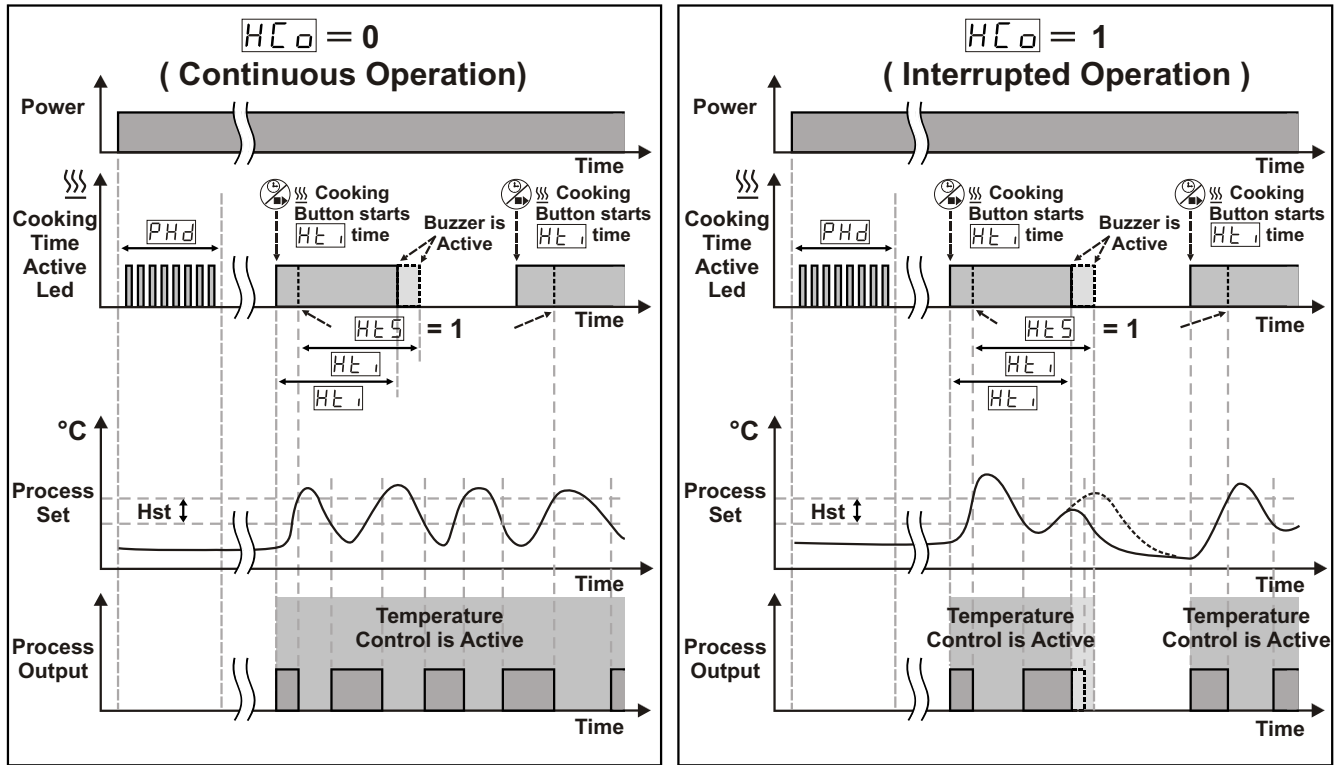
1- When cooking time parameter  $[HE-1]$  1, if selection of temperature control and starting the cooking time parameter  $[PH5] = 0$  ( Temperature control and cooking time starts at power on) is selected;



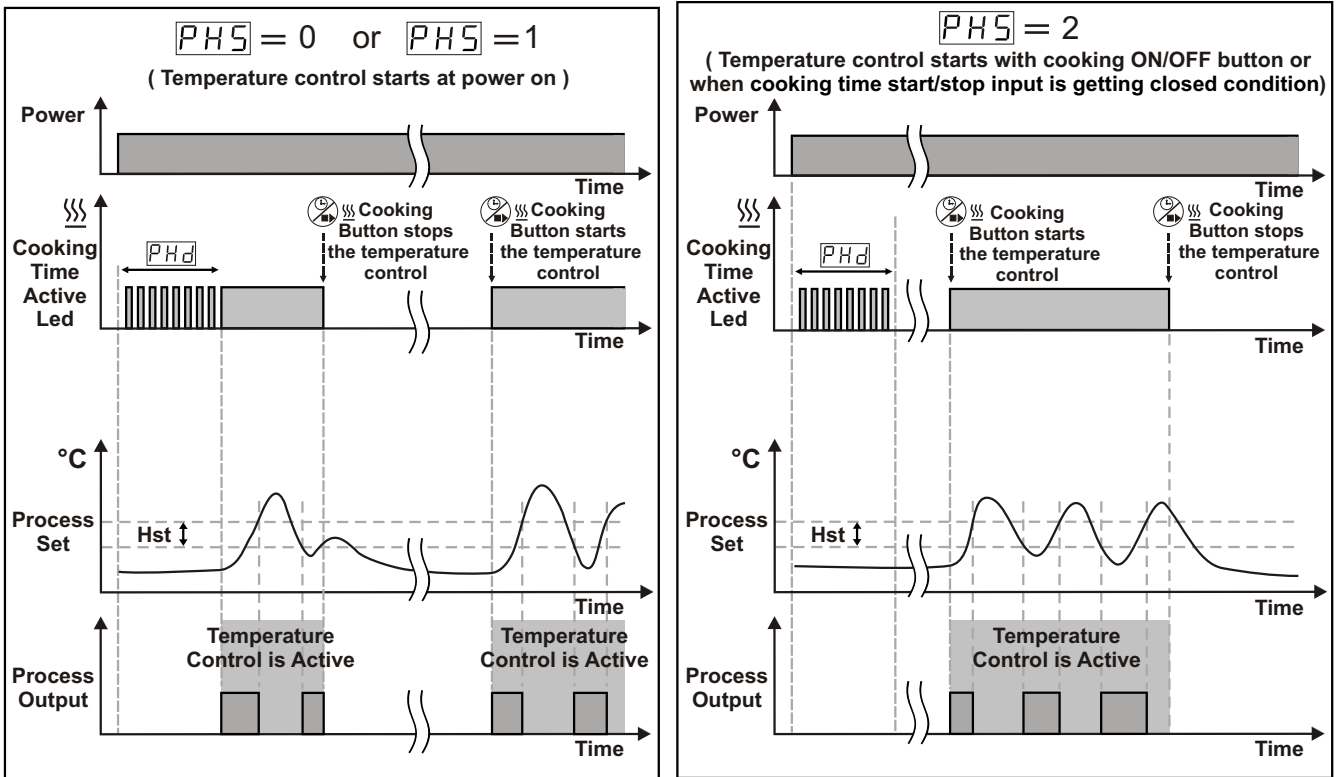
2- When cooking time parameter  $[HE-1]$  1, if selection of temperature control and starting the cooking time parameter  $[PH5] = 1$  ( Temperature control starts at power on. Cooking time (Timer) can be started by pressing cooking ON/OFF button or when cooking time start/stop input is getting closed condition) is selected;



3- When cooking time parameter  $[HE-1]$  1, if selection of temperature control and starting the cooking time parameter  $[PH5] = 2$  ( Temperature control and cooking time (Timer) can be started by pressing cooking ON/OFF button or when cooking time start/stop input is getting closed condition) is selected;



4- Manual Control : If cooking time (Timer)  $[HE-1] = --$



#### Heating Controller

#### ESM-3711-H 77x35 DIN Size



#### ESM-3711-H 77 x 35 DIN Size Digital, ON / OFF Temperature Controller

- 3 Digits display
- NTC Input or, PTC Input or, J type Thermocouple Input or, K type Thermocouple Input or, 2-Wire PT 100 Input or, 2-Wire PT 1000 Input (It must be determined in order)
- ON/OFF temperature control
- Adjustable temperature offset
- Set value low limit and set value high limit boundaries
- Relay or SSR driver output
- Digital Input (Cooking time start/stop input)
- Adjustable cooking time from front panel
- Temperature control according to the cooking time (Timer)
- User can select to start cooking time (Timer) when temperature reaches to the set value
- Temperature control with manual heating function
- Alarm parameters
- Adjustable internal buzzer according to cooking time, probe defect and alarm status
- Button protection
- Password protection for programming section

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#### 1.Preface

ESM-3711-H series heating controllers are designed for measuring and controlling temperature. They can be used in many applications with their easy use, On/ Off control form and cooking time properties. Some application fields which they are used are below:

**Application Fields**  
Glass  
Food  
Plastic  
Petro-Chemistry  
Textile, Automotive  
Machine Production Industries  
etc...

**Applications**  
Heating  
Baking Ovens  
Incubators  
Storages  
Air Conditioning  
Etc...

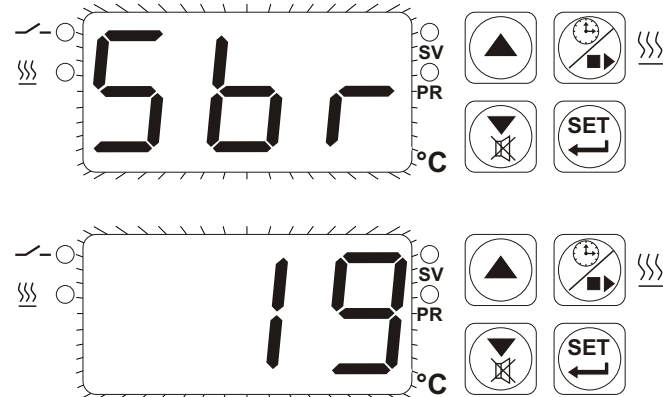
#### 1.1 Operating Conditions

- Operating Temperature : 0 to 50 °C
- Max. Operating Humidity : 90% Rh (non-condensing)
- Altitude : Up to 2000 m.
- Forbidden Conditions:  
Corrosive atmosphere, Explosive atmosphere,  
Home applications (The unit is only for industrial applications)

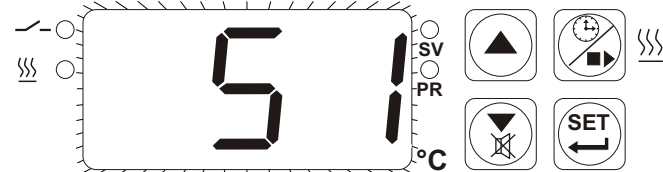
#### 1.2 General Specifications

ESM-3711-H		Standard
Power Supply Input		230 V ~ (±15) , 50/60Hz
		Optional Supply Input
		115 V ~ (±15) , 50/60Hz
		24 V ~ (±15) , 50/60Hz
		24 V ~ (-15, +10), 50/60Hz
10...30 V ==		
Temperature Sensor Input		NTC
		PTC
		J or K Type TC
		2-wire PT 100
		2-wire PT 1000
Digital Input		Cooking Time(Timer)
		Start/Stop Input
Standard		
Output-1 (Relay Output)		Control Output
		Alarm Output
Optional		
Output-1 (SSr Driver Output)		Control Output
		Alarm Output
		Heating Function ON/OFF Operation

#### 5. Failure Messages in ESM-3711-H Heating Controller



Example-1 : If alarm function selection parameter  $[AL5]$  in programming section is 1(Absolute alarm) and minimum alarm parameter  $[RL1]$  is 20 ; When temperature is less than 20°C, value on the screen starts to blink. Also if buzzer function selection parameter  $[b u F]$  is 2 or 4, then internal buzzer is on.



Example-2 : If alarm function selection parameter  $[AL5]$  in programming section is 1 (Absolute Alarm) and maximum alarm parameter  $[RL1]$  is 50 When temperature is above 50 °C, value on the screen starts to blink. Also buzzer function selection parameter  $[b u F]$  is 2 or 4, then internal buzzer is on.

#### 6. Ordering Information

ESM-3711-H ( 77 x 35 DIN Size )		A	BC	D	E	F	FG	HI	I	U	V	W	Z
<b>A Supply Voltage</b>		<b>BC Input Type</b>											
2 24 V ~ ( -%15, +%10 ) 50/60 Hz		05 J , Fe CuNi IEC584.1(ITS90) 0°C 800°C											
3 24 V ~ ( ± %15 ) 50/60 Hz		10 K , NiCr Ni IEC584.1(ITS90) 0°C 999°C											
4 115 V ~ ( ± %15 ) 50/60 Hz		11 PT 100, IEC751(ITS90) -50°C 400°C											
5 230 V ~ ( ± %15 ) 50/60 Hz		09 PT 100, IEC751(ITS90) -19.9°C 99.9°C											
6 10...30 V ~		12 PTC (Not-1) -50°C 150°C											
9 Customer		15 PTC (Not-1) -19.9°C 99.9°C											
		14 PT 1000, IEC751(ITS90) -50°C 400°C											
		13 PT 1000, IEC751(ITS90) -19.9°C 99.9°C											
		18 NTC (Not-1) -50°C 100°C											
		19 NTC (Not-1) -19.9°C 99.9°C											
<b>E Output-1</b>													
1 Relay Output ( resistive load 10 A@250 V ~ , 1 NO + 1NC )													
2 SSR Driver Output (Maximum 28 mA, 15 V ~)													
<b>V Temp. Sensor which is given with ESM 3711H</b>													
0 None													
1 PTC-M6L40.K1.5 (PTC Air Probe with 1.5 m silicon cable)													
2 PTC-M6L30.K1.5.1/8" (PTC Liquid Probe with 1.5 m silicon cable)													
3 NTC-M5L20.K1.5 (NTC Probe, thermoplastic moulded with 1.5 m cable for cooling application)													
4 NTC-M6L50.K1.5 (NTC Probe, stainless steel housing with 1.5 m cable for cooling application)													
9 Customer													

Note-1 : If input type is selected PTC or NTC (BC = 12, 15, 18, 19), Temperature sensor is given with the device. For this reason, if input type is selected as PTC, sensor type (V = 0, 1 or 2) or if input type is selected as NTC, sensor type (V = 0, 3 or 4) must be declared in ordering information.

#### 6. Specifications

Device Type	: Heating Controller
Housing&Mounting	: 77mm x 35mm x 62.5mm plastic housing for panel Mounting. Panel cut-out is 71x29mm.
Protection Class	: NEMA 4X (IP65 at front, IP20 at rear).
Weight	: Approximately 0.20 Kg.
Environmental Ratings	: Standard, indoor at an altitude of less than 2000 meters with none condensing humidity.
Storage / Operating Temperature	: -40 °C to +85 °C / 0 °C to +50 °C
Storage / Operating Humidity	: 90 % max. (None condensing)
Installation	: Fixed installation
Overvoltage Category	: II.
Pollution Degree	: II, office or workplace, none conductive pollution
Operating Conditions	: Continuous
Supply Voltage and Power	: 230V ~ ( ± 15%) 50/60 Hz. 1.5VA 115V ~ ( ± 15%) 50/60 Hz. 1.5VA 24V ~ ( ± 15%) 50/60 Hz. 1.5VA 24 V ~ (-%15, +%10) 50/60 Hz. 1.5 VA 10...30V ~ 1.5 W

Temperature Sensor Inputs	: NTC, PTC, TC, RTD
NTC Input Type	: NTC (10 k @ 25 °C)
PTC Input Type	: PTC (1000 @ 25 °C)
Thermocouple Input Types	: J, K (IEC584.1)(ITS90)
Thermoresistance Input Type	: PT-100, PT-1000 (IEC751)(ITS90)
Accuracy	: ± 1 % of full scale for thermocouple and thermoresistance
Cold Junction Compensation	: Automatically ± 0.1°C/1°C.
Sensor Break Protection	: Upscale
Sampling Cycle	: 3 samples per second
Control Form	: ON / OFF
Relay Output	: 10A@250V ~ for resistive load (Electrical Life : 100.000 switching at full load)

Optional SSR Output	: Maximum 28 mA, Maximum 15 V ~
Display	: 14 mm Red 3 digits LED Display
LED	: SV (Green), Output Active (Red), PR(Red), Cooking Time Active (Red) 3 mm Led

Internal Buzzer	: 83dB
Approvals	: GOST-R, CEC

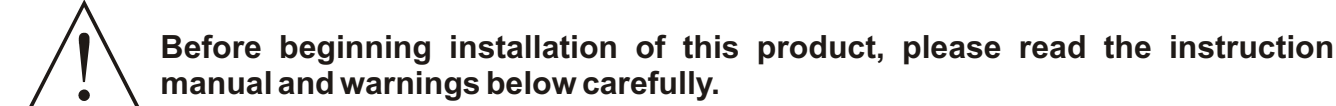
#### 7. Other Informations

**Manufacturer Information:**  
Emko Elektronik Sanayi ve Ticaret A.Ş.  
Demirtaş Organize Sanayi Bölgesi Karanfil Sk. No:6 16369 BURSA / TURKEY  
Tel : +90 224 261 1900 Fax : +90 224 261 1912

**Repair and maintenance service information:**  
Emko Elektronik Sanayi ve Ticaret A.Ş.  
Demirtaş Organize Sanayi Bölgesi Karanfil Sk. No:6 16369 BURSA / TURKEY  
Tel : +90 224 261 1900 Fax : +90 224 261 1912



#### 1.3.Installation



- In package ,
- One piece unit
- Two pieces mounting clamps
- One piece instruction manual

A visual inspection of this product for possible damage occurred during shipment is recommended before installation. It is your responsibility to ensure that qualified mechanical and electrical technicians install this product.

If there is danger of serious accident resulting from a failure or defect in this unit, power off the system and separate the electrical connection of the device from the system.

The unit is normally supplied without a power supply switch or a fuse. Use power switch and fuse as required.

Be sure to use the rated power supply voltage to protect the unit against damage and to prevent failure.

Keep the power off until all of the wiring is completed so that electric shock and trouble with the unit can be prevented.

Never attempt to disassemble, modify or repair this unit. Tampering with the unit may results in malfunction, electric shock or fire.

Do not use the unit in combustible or explosive gaseous atmospheres.

During the equipment is putted in hole on the metal panel while mechanical installation some metal burrs can cause injury on hands, you must be careful.

Montage of the product on a system must be done with it's fixing clamps. Do not do the montage of the device with inappropriate fixing clamp. Be sure that device will not fall while doing the montage.

It is your responsibility if this equipment is used in a manner not specified in this instruction manual.

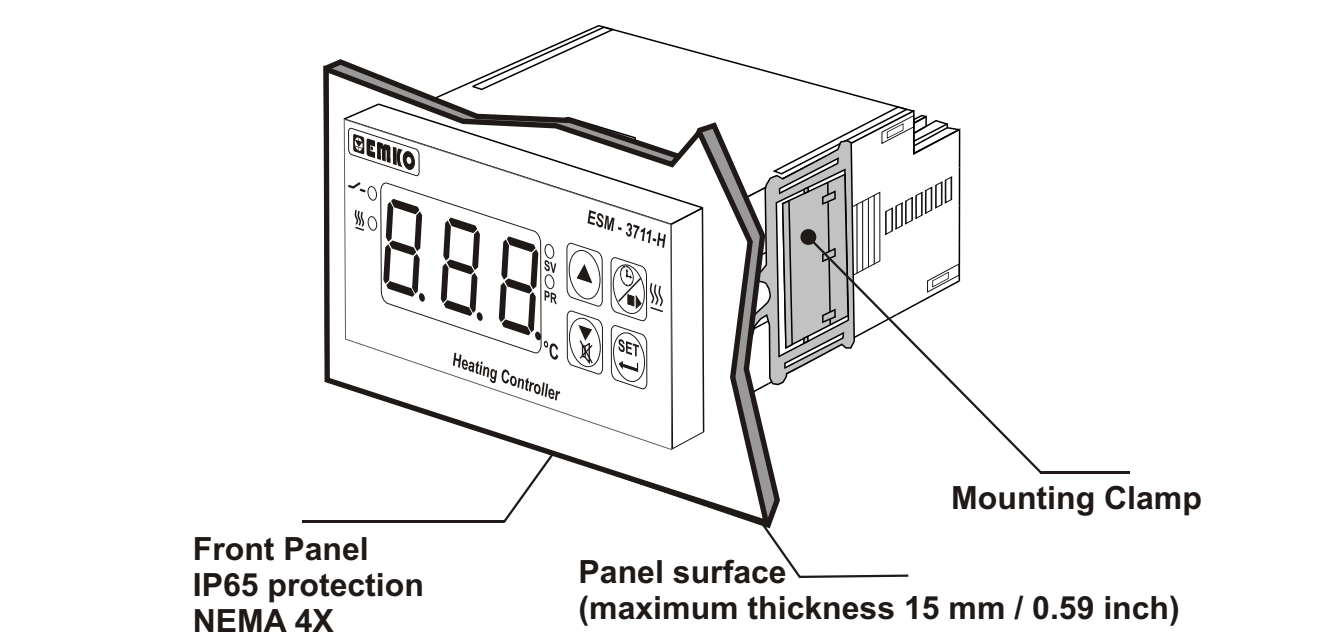
#### 1.4 Warranty

EMKO Elektronik warrants that the equipment delivered is free from defects in material and workmanship. This warranty is provided for a period of two years. The warranty period starts from the delivery date. This warranty is in force if duty and responsibilities which are determined in warranty document and instruction manual performs by the customer completely.

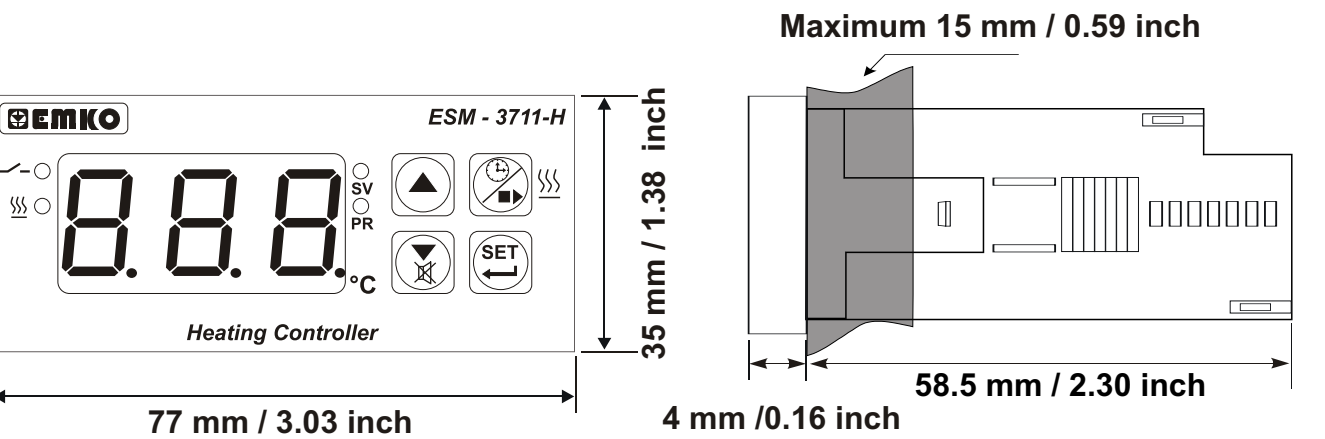
#### 1.5 Maintenance

Repairs should only be performed by trained and specialized personnel. Cut power to the device before accessing internal parts.  
Do not clean the case with hydrocarbon-based solvents (Petrol, Trichlorethylene etc.). Use of these solvents can reduce the mechanical reliability of the device. Use a cloth dampened in ethyl alcohol or water to clean the external plastic case.

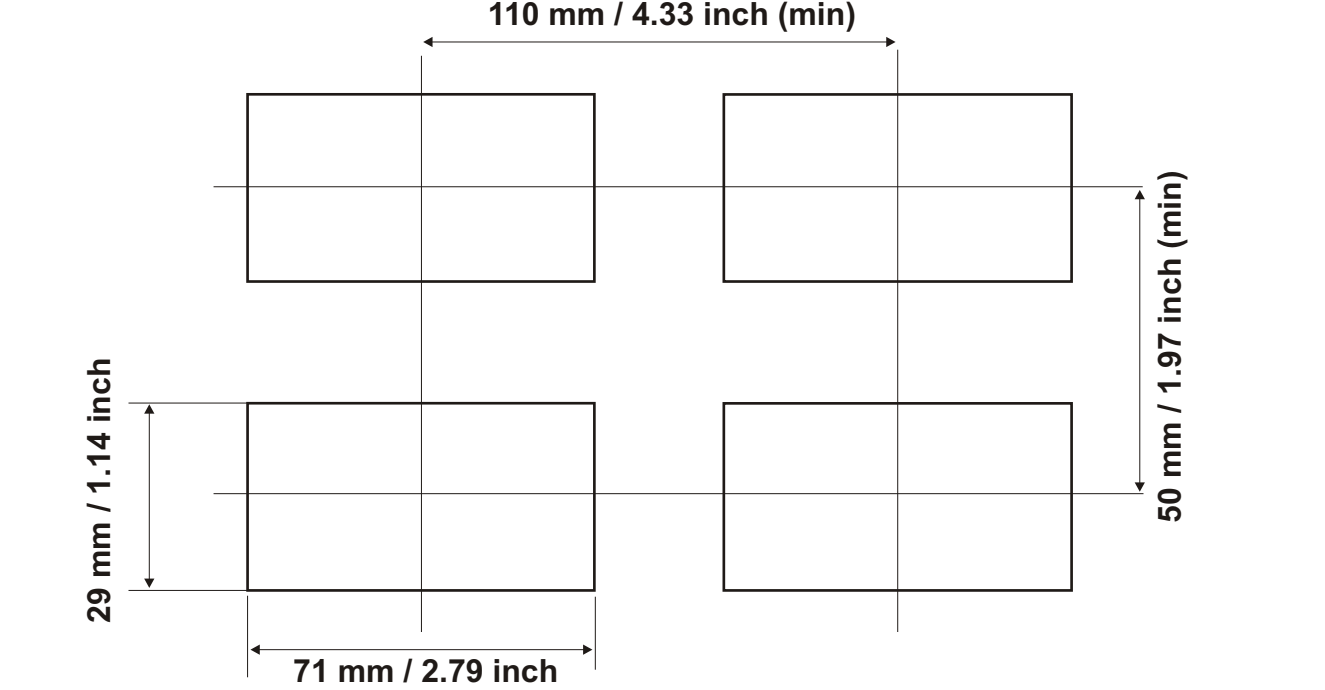
#### 2.1 General Description



#### 2.2 Front View and Dimensions of ESM-3711-H Temperature Controller

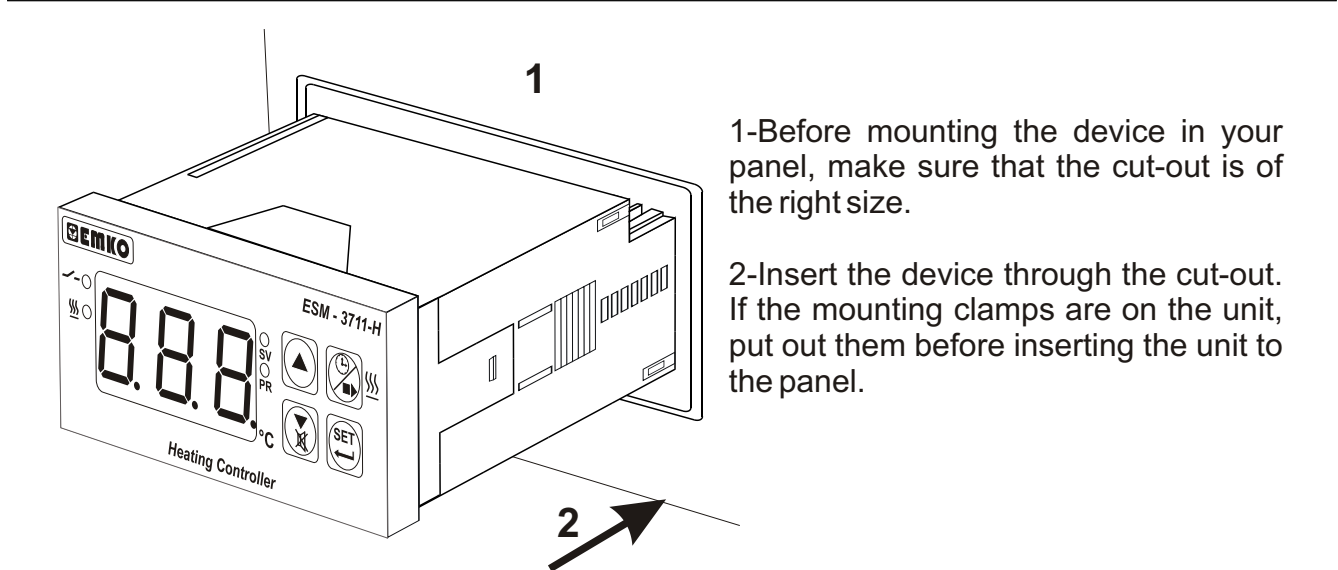


#### 2.3 Panel Cut-Out

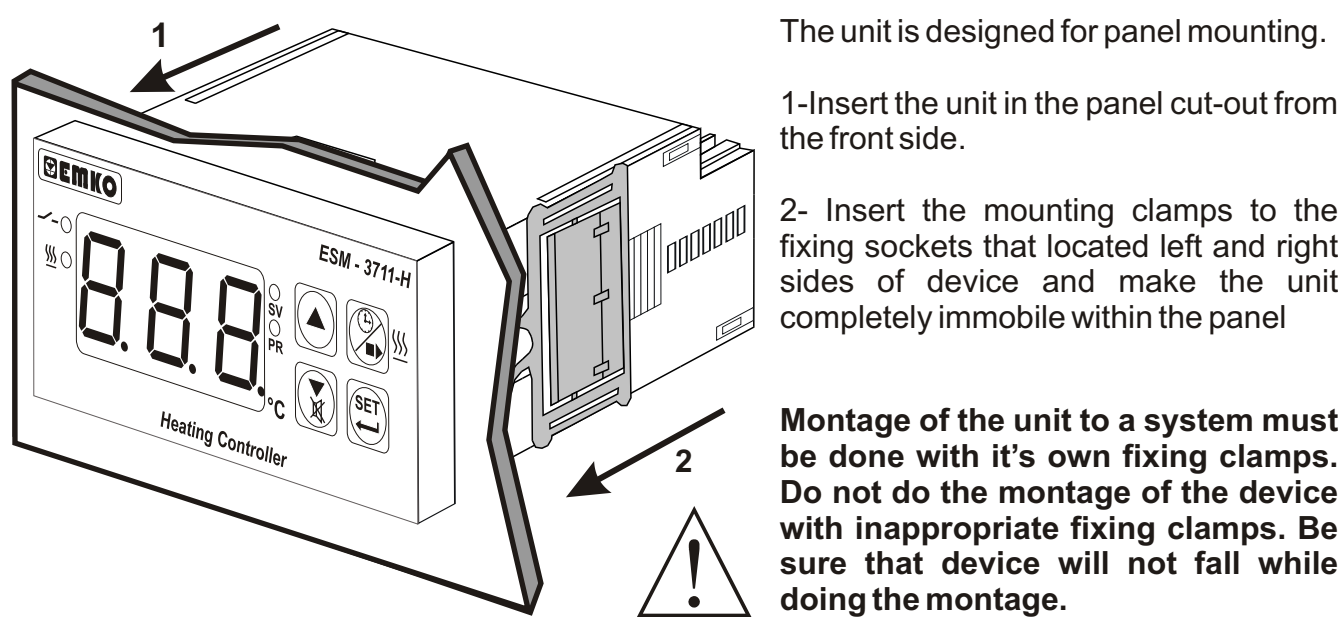




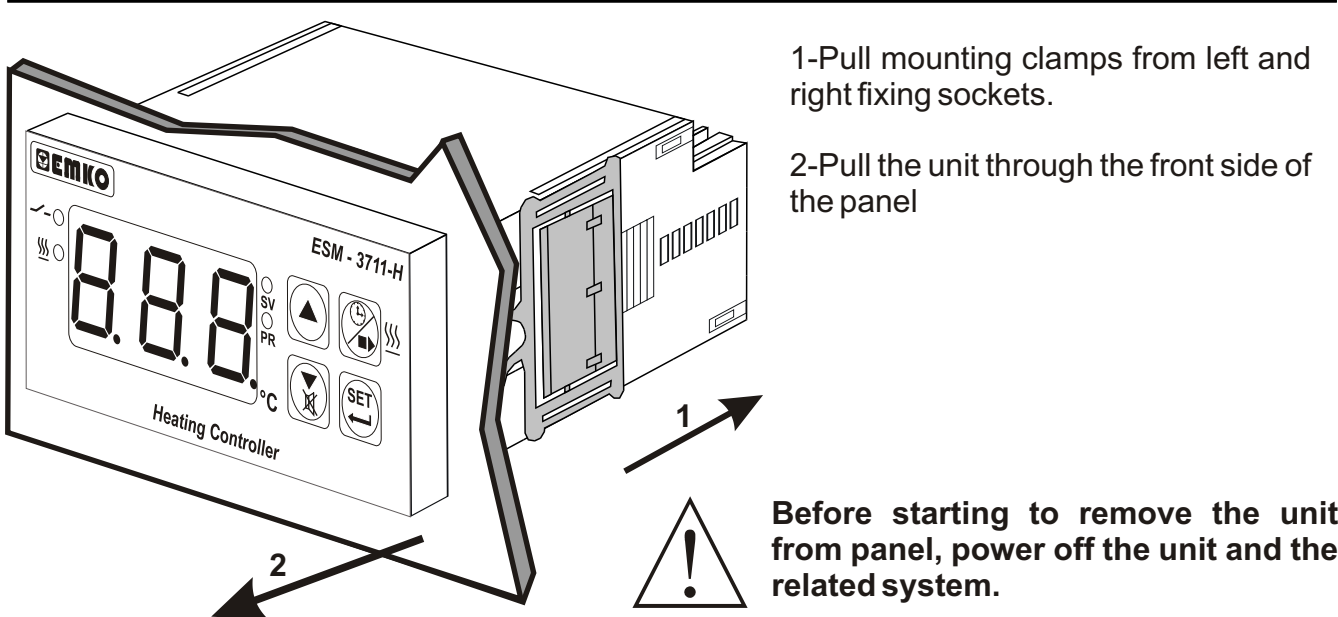
#### 2.4 Panel Mounting



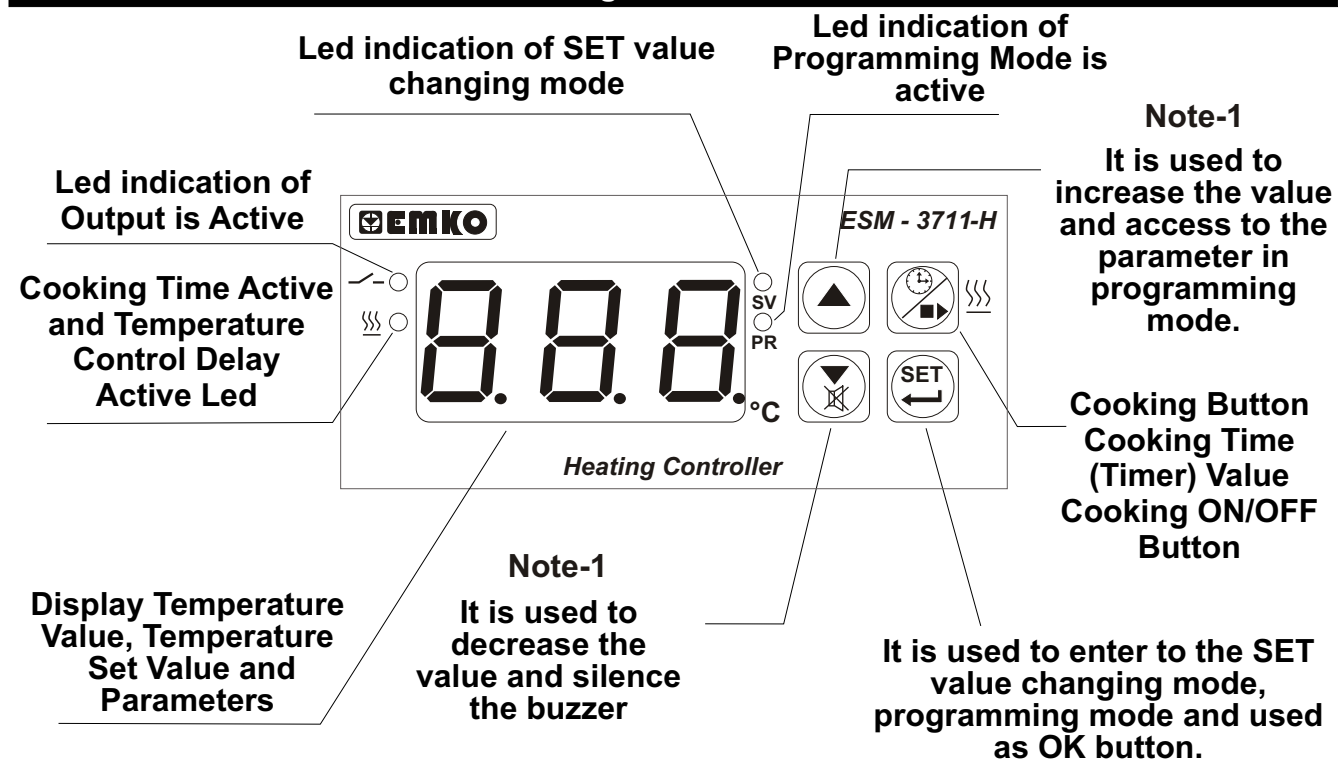
#### 2.5 Installation Fixing Clamp



#### 2.6 Removing from the Panel



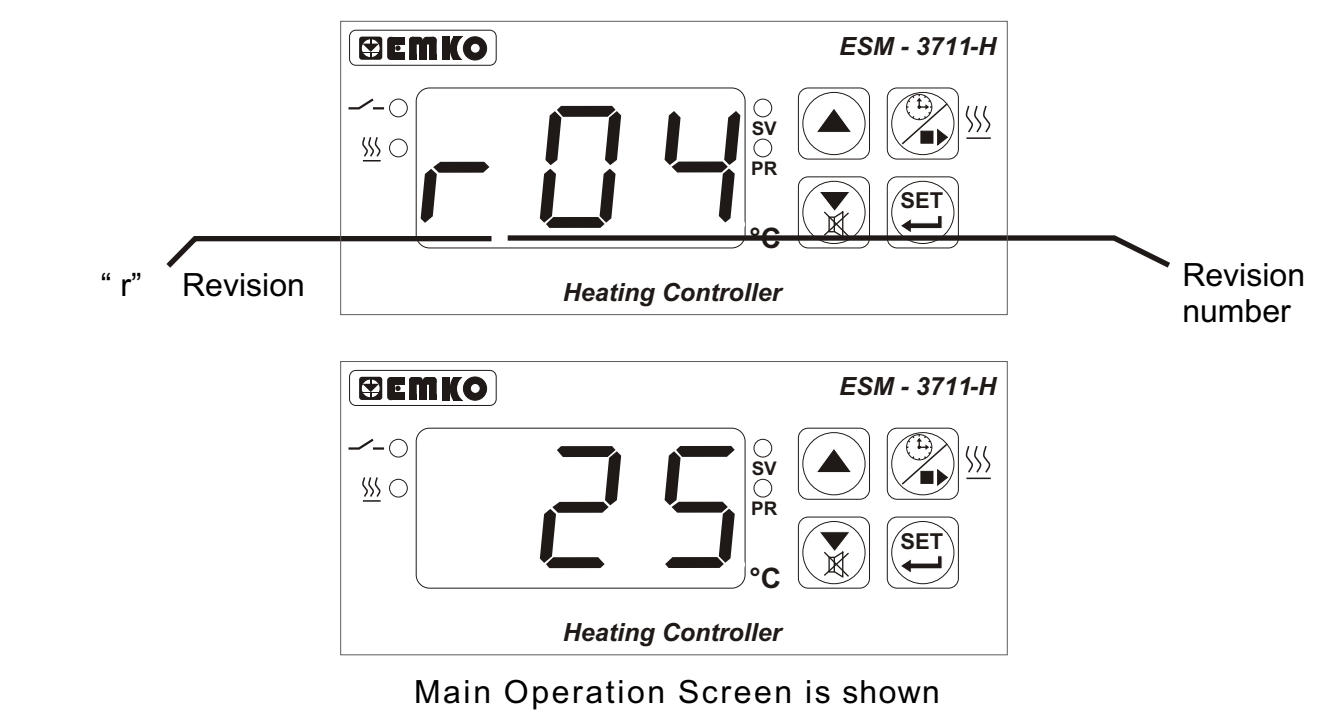
#### 4. Front Panel Definition and Accessing to the Menus



**Note-1:** If increment or decrement button is pressed for 5 seconds continuously, increment and decrement number become 10, if increment or decrement button is pressed for 10 seconds continuously, increment and decrement number become 100.

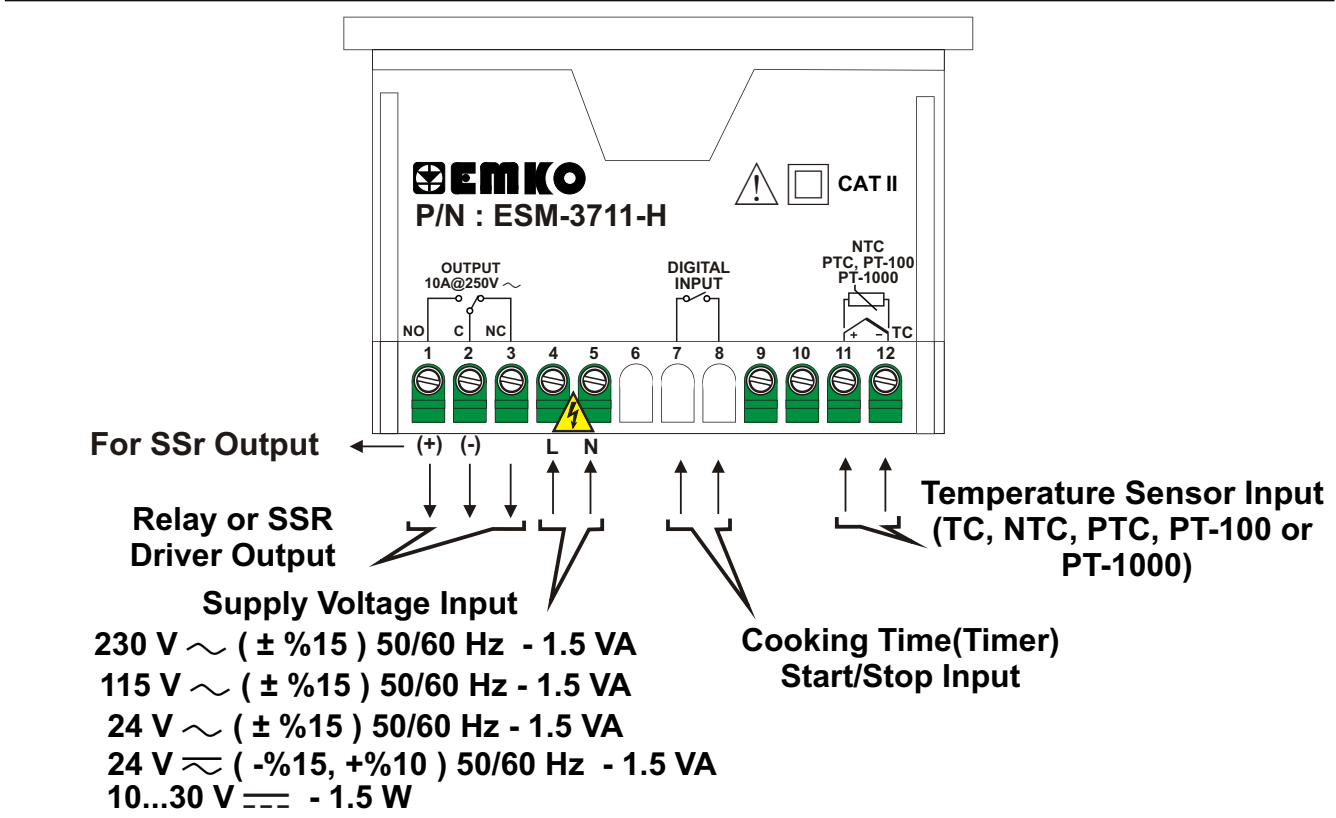
#### 4.1 Observation of Software Revision on the Displays

When power is first applied to the temperature controller, software revision number is shown on the displays.

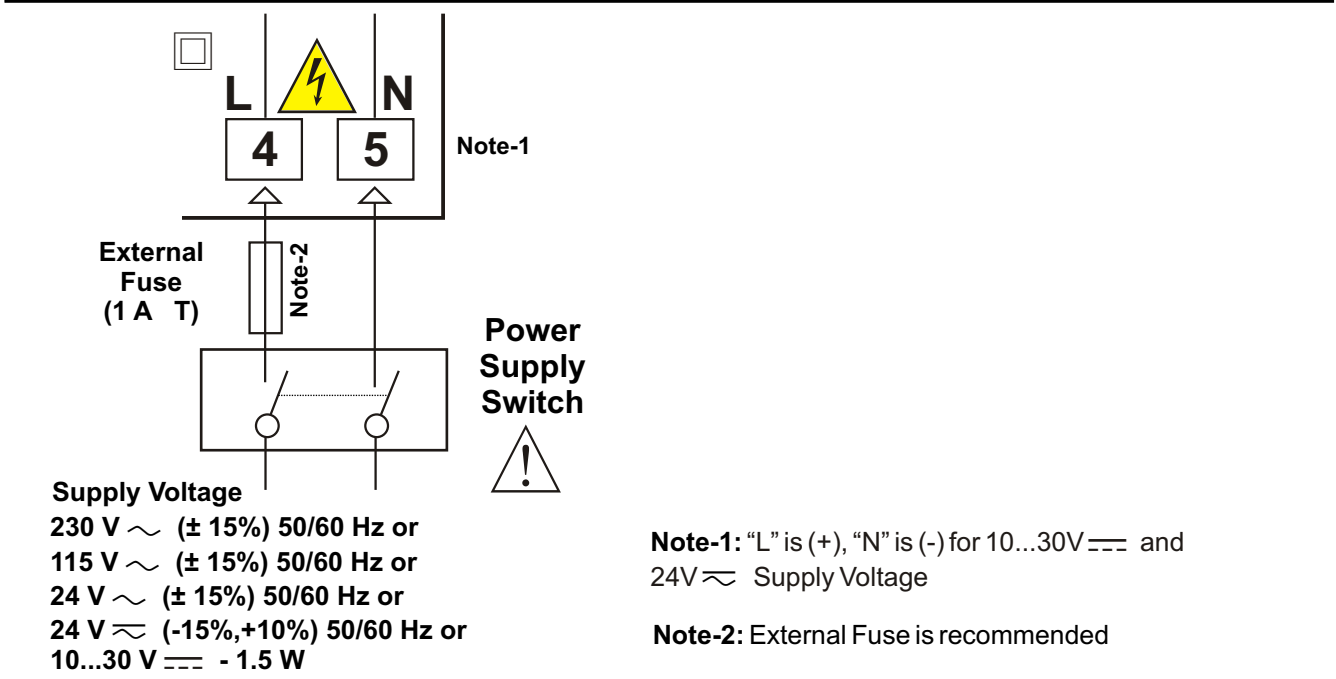


**!** If there is an unexpected situation while opening the device, power off the device and inform a qualified personnel.

#### 3. Electrical Wiring Diagram



#### 3.1 Supply Voltage Input Connection of the Device

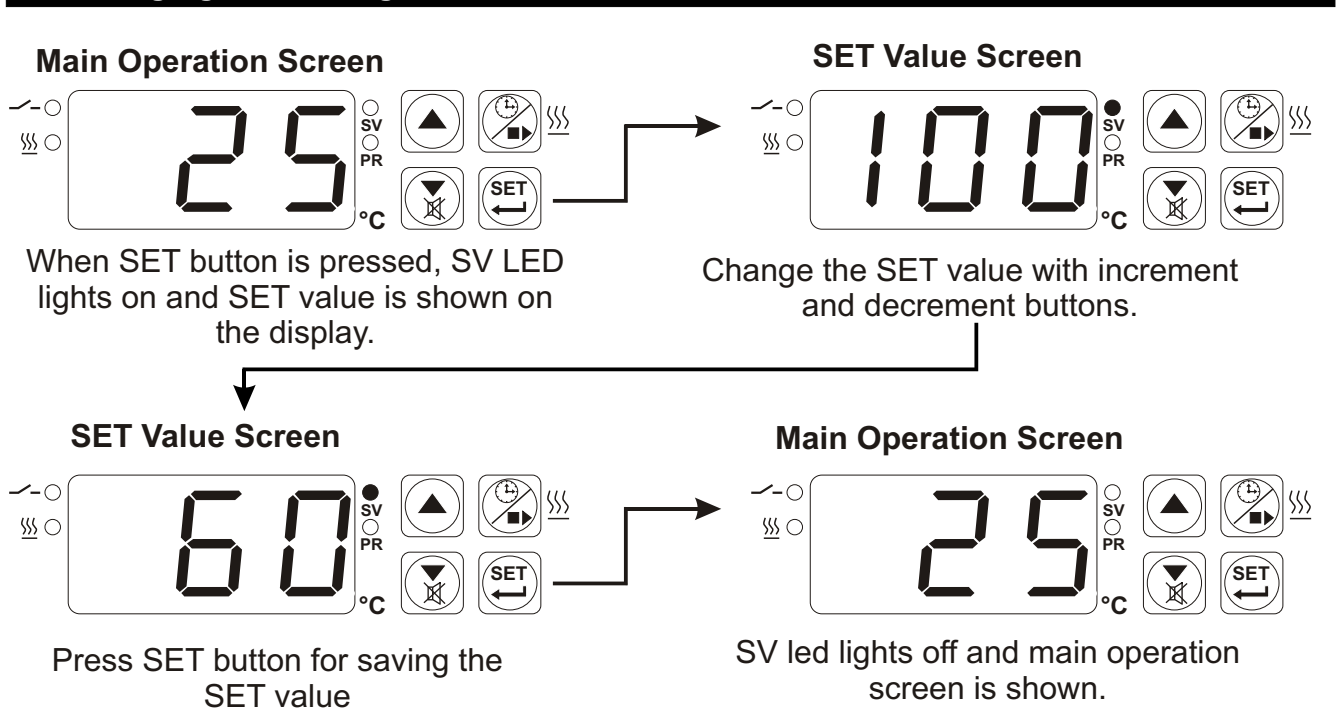


Make sure that the power supply voltage is same indicated on the instrument. Switch on the power supply only after that all the electrical connection have been completed. Supply voltage range must be determined in order. While installing the unit, supply voltage range must be controlled and appropriate supply voltage must be applied to the unit. Controlling prevents damages in unit and system and possible accidents as a result of incorrect supply voltage.

There is no power supply switch or fuse on the device. So a power supply switch and a fuse must be added to the supply voltage input. Power supply switch must be two poled for separating phase and neutral. On/Off condition of power supply switch is very important in electrical connection. On/Off condition of power supply switch must be signed for preventing the wrong connection.

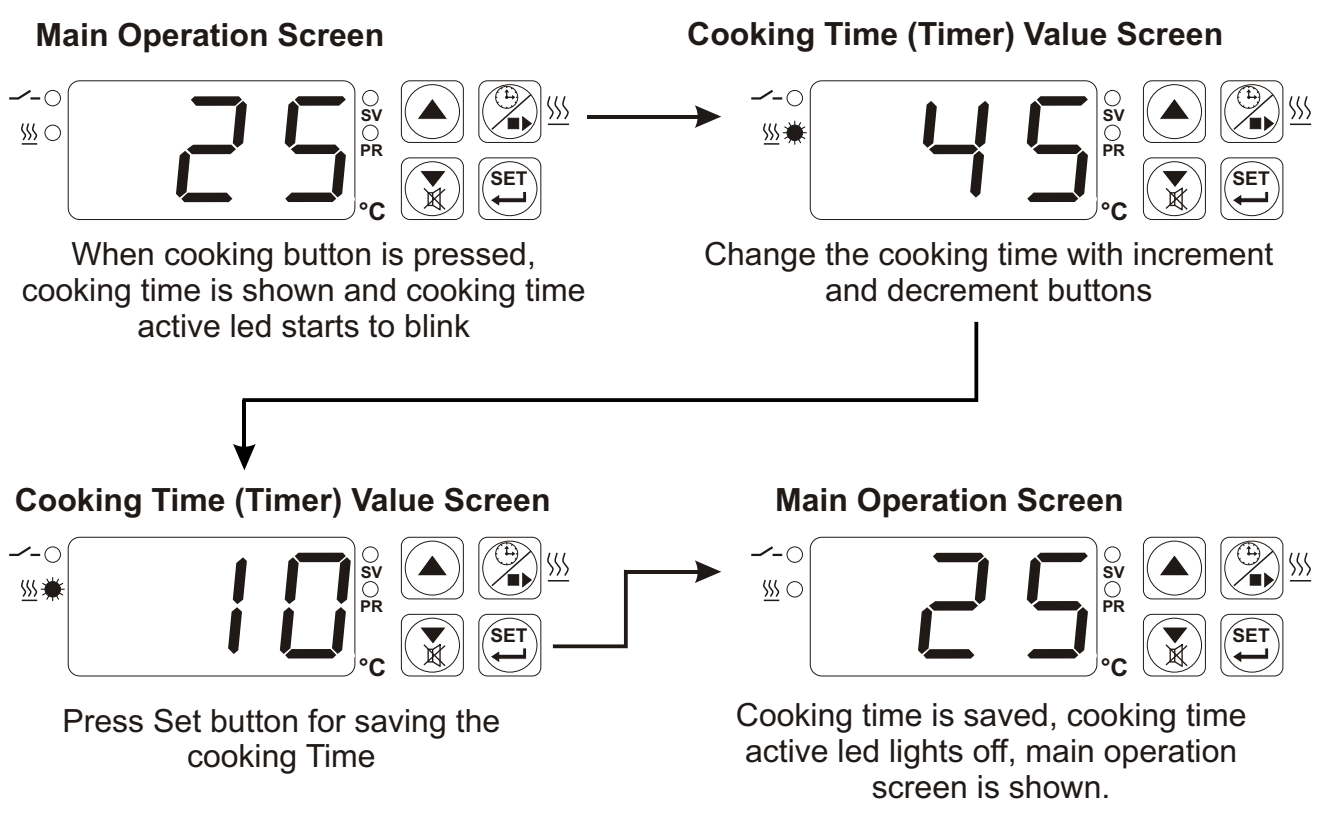
External fuse must be on phase connection in ~ supply input. External fuse must be on (+) line connection in --- supply input.

#### 4.2 Changing and Saving Set Value



SET value is can be adjusted from minimum set value parameter [5uL] to maximum set value parameter [5uH], Which can be accessed from programming parameters.

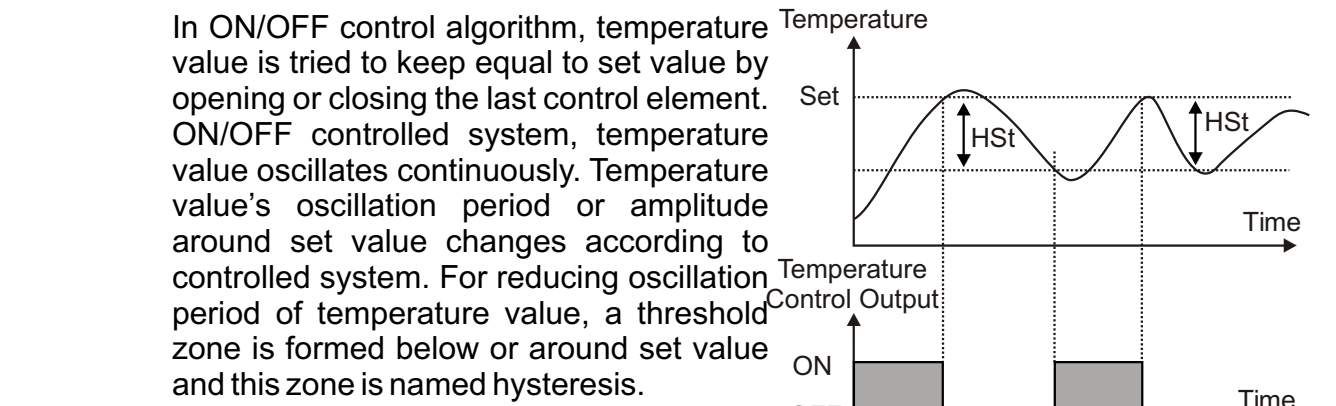
#### 4.3 Changing and Saving Cooking Time (Timer) Parameter Value



**i** If no operation is performed in cooking Time enter mode and Set value enter mode for 20 seconds, device turns to main operation screen automatically.

#### 4.4 Programming Mode Parameter List

**HSE Hysteresis Parameter for Output (Default = 1)**  
From 1 to 100 °C for TC Type devices,  
From 1 to 100 °C for PT-100 (-50°C, 400°C) and PT-1000 (-50°C, 400°C),  
From 0.1 to 10.0 °C for PT-100 (-19.9°C, 99.9°C) and PT-1000 (-19.9°C, 99.9°C),  
From 1 to 20 °C for PTC (-50°C, 150°C) and NTC (-50°C, 100°C),  
From 0.1 to 10.0 °C PTC (-19.9°C, 99.9°C) and NTC (-19.9°C, 99.9°C)



**5uL Minimum Set Value Parameter (Default = Input Type Minimum Scale)**  
Set value can not be lower than this value. This parameter value can be adjusted from minimum value of device scale to maximum set value parameter [5uH]

**5uH Maximum Set Value Parameter (Default = Input Type Maximum Scale)**  
Set value can not be greater than this value. This parameter value can be adjusted from minimum set value parameter [5uL] to maximum value of the device scale

**oFt Process Offset Parameter (Default = 0)**  
From -100 to 100°C for TC Type devices,  
From -100 to 100°C for PT-100 (-50°C, 400°C) and PT-1000 (-50°C, 400°C),  
From -10.0 to 10.0 °C for PT-100 (-19.9°C, 99.9°C) and PT-1000 (-19.9°C, 99.9°C),  
From -20 to 20 °C for PTC (-50°C, 150°C) and NTC (-50°C, 100°C),  
From -10.0 to 10.0 °C for PTC (-19.9°C, 99.9°C) and NTC (-19.9°C, 99.9°C)

**PHd Temperature Control Delay at Power On (Default = 0)**  
It can be adjusted from 0 to 99 minutes.

**Ht Cooking Time (Timer) Parameter (Default = 45)**  
It can be adjusted from 1 to 999 minutes. When it is 1, [---] can be observed by pressing decrement button on the display. So Manual Control is selected. In Manual control, user can start and stop temperature controlling with cooking ON/OFF button or cooking time start/stop input.

**PHS Selection of Temperature Control and Starting Cooking Time (Timer) Parameter (Default = 0)**

- 0 Temperature control and cooking time (Timer) starts at power on
- 1 Temperature control starts at power on. Cooking time (Timer) can be started by pressing cooking ON/OFF button or when cooking time start/stop input is getting closed condition.
- 2 Temperature control and cooking time (Timer) can be started by pressing cooking ON/OFF button or when cooking time start/stop input is getting closed condition.

**bon Buzzer is Active During This Time (Default = ---)**  
This parameter can be observed if buzzer function selection [buF] is 1. It can be adjusted from 1 to 99 minutes. When this parameter is 1, if decrement button is pressed, [---] is observed. Then buzzer becomes active till buzzer silence button

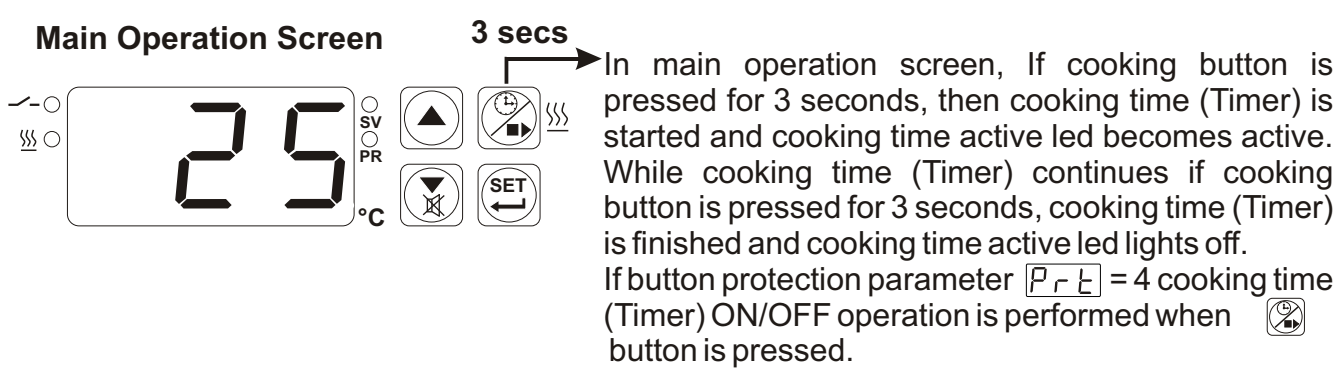
**Prb Button Protection Parameter (Default = 0)**

- 0 There is no protection
- 1 Cooking time(Timer) can not be changed. Cooking ON/OFF operation is not performed.
- 2 SET value can not be changed
- 3 Cooking time (Timer) and set value can not be changed. Cooking ON/OFF operation is not performed.
- 4 Cooking time (Timer) and set value can not be changed. Cooking ON/OFF operation is performed when [OK] button is pressed.

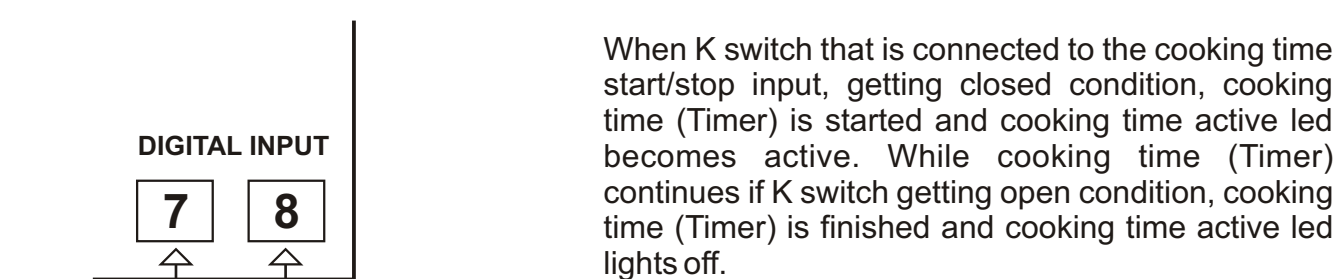
**PAS Programming Mode Accessing Password (Default = 0)**  
Password for entering to the programming mode is defined with this parameter. It can be adjusted from 0 to 999. If it is 0, programming mode accessed without entering password.

#### 4.5 Cooking Time (Timer) ON/OFF Operation

##### 4.5.1 Cooking Time (Timer) ON/OFF Operation with Cooking Button



##### 4.5.2 Cooking Time (Timer) ON/OFF Operation with Cooking Time Start/Stop Input



When K switch that is connected to the cooking time start/stop input, getting closed condition, cooking time (Timer) is started and cooking time active led becomes active. While cooking time (Timer) continues if K switch getting open condition, cooking time (Timer) is finished and cooking time active led lights off.

**HtS Cooking Time Starting Conditions Parameter (Default = 0)**  
This parameter can be observed if cooking time (Timer) [HtS] is 1.  
0 Cooking time (Timer) is started with cooking ON/OFF button or when cooking time start/stop input is getting closed condition.  
1 Cooking time (Timer) is started when temperature reaches to the process set value after pressing cooking ON/OFF button or when cooking time start/stop input is getting closed condition.

**HCo Temperature Controlling Continuity Selection Parameter (Default = 0)**  
Temperature controlling can be continues or stopped according to the selection. This parameter can be observed if cooking time (Timer) [HCo] is 1

0 **Continuous Operation** : Temperature control starts after the temperature control starting delay at power on [PHd] is expired and continues. If buzzer function selection parameter [buF] is 1 or 4, at the end of the cooking time, (Timer) internal buzzer operates to indicate cooking time has finished.

1 **Interrupted Operation** : Temperature control starts after temperature control starting delay at power on [PHd] is expired. Temperature control can be stopped at the end of the cooking time (Timer) or by pressing cooking ON/OFF button or when cooking time start/stop input is getting open condition. Temperature control does not start till cooking ON/OFF button is pressed again or when cooking time start/stop input is getting closed condition again.

**RLS Temperature Alarm Function Selection Parameter (Default = 0)**

- 0 Temperature Alarm function is inactive.
- 1 Absolute alarm is selected. If temperature is lower than [RuL] and higher than [RuH], then alarm is on.
- 2 Relative alarm is selected. Alarm operates according to the set value. If temperature is below (Set - [RuL]) or above (Set + [RuH]), alarm occurs.

**RuL Minimum Alarm Parameter (Default = Input Type Minimum Scale)**  
It can be adjusted from minimum scale of the device to maximum alarm value (AuH).

**RuH Maximum Alarm Parameter (Default = Input Type Maximum Scale)**  
It can be adjusted from minimum alarm value (AuL) to maximum scale of the device.

**AdL Alarm Delay Parameter (Default = 0)**  
If an alarm occurs, delay can be defined with this parameter. It can be adjusted from 0 To 99 minutes.

**APd Alarm Delay After Power On Parameter (Default = 0)**  
This parameter defines the delay for the alarm is being active after power on. It can be adjusted from 0 to 99 minutes.

**buF Buzzer Function Selection Parameter (Default = 1)**

- 0 Buzzer is inactive.
- 1 Buzzer is active at the end of the cooking time.
- 2 Buzzer is active if an alarm occurs.
- 3 Buzzer is active during sensor failures.
- 4 Buzzer is active at the end of the cooking time, alarm or sensor failures.

#### 4.6 Entering to the Programming Mode, Changing and Saving Parameters

